

Homework

Variables on Both Sides

Some equations contain variables on both sides and require more than one step to solve. To solve these equations, first use the Addition or Subtraction Property of Equality to write an equivalent equation that has all of the variables on one side. Then solve and check.

Example 1: Solve $2x - 6 = x + 4$.

$$\begin{aligned} 2x - 6 &= x + 4 \\ 2x - 6 - x &= x + 4 - x \\ x - 6 &= 4 \\ x - 6 + 6 &= 4 + 6 \\ x &= 10 \end{aligned}$$

Check: $2x - 6 = x + 4$

$$\begin{aligned} 2(10) - 6 &\stackrel{?}{=} 10 + 4 \\ 20 - 6 &\stackrel{?}{=} 14 \\ 14 &= 14 \checkmark \end{aligned}$$

Example 2: Solve $\frac{1}{4}x - 12 = \frac{3}{4}x$.

$$\begin{aligned} \frac{1}{4}x - 12 &= \frac{3}{4}x \\ \frac{1}{4}x - 12 - \frac{1}{4}x &= \frac{3}{4}x - \frac{1}{4}x \\ -12 &= \frac{1}{2}x \end{aligned}$$

$$\begin{aligned} 2 \cdot (-12) &= 2 \cdot \frac{1}{2}x \\ -24 &= x \end{aligned}$$

Check: $\frac{1}{4}x - 12 = \frac{3}{4}x$

$$\begin{aligned} \frac{1}{4}(-24) - 12 &\stackrel{?}{=} \frac{3}{4}(-24) \\ -6 - 12 &\stackrel{?}{=} -18 \\ -18 &= -18 \checkmark \end{aligned}$$

Solve each equation. Show the steps

1. $6m - 40 = m$

2. $-5y - 2 = y + 10$

3. $-15n = -12n + 9$

4. $-4y + 6 = -3y + 12$

5. $6y - 8 = 6y - 6 - 2$

6. $-15x + 8 = -15x - 7$

7. $4.2y + 4.4 = 3.1y$

8. $w = 3.8w - 7$

9. $-8 - m = -3.5m + 5$

10. $\frac{1}{5}x + 12 = \frac{2}{5}x$